D101.22/3:
385-71

AMC PAMPHLET
AMCP 385-71

SAFETY DIGEST

UNIV. OF FLORIDA LIBS.
DOCUMENTS
DEPARTMENT
U.S. DEPOSITORY

UNIVERSITY OF FLORIDA LIBRARIES
JUL 1966

MAY 1966

U. S. ARMY MATERIEL COMMAND

SUPPORTS ARMY AVIATION SAFETY

ARMY AVIATION SAFETY

SIGNAL CORPS SPECIFICATION, NO. 486.

ADVERTISEMENT AND SPECIFICATION FOR A HEAVIER-THAN-AIR FLYING MACHINE.

To the Public:

Sealed proposals, in duplicate, will be received at this office until 12 o'clock noon on February 1, 1908, on behalf of the Board of Ordnance and Fortification for furnishing the Signal Corps with a heavier-than-air flying machine. All proposals received will be turned over to the Board of Ordnance and Fortification at its first meeting after February 1 for its official action.

Persons wishing to submit proposals under this specification can obtain the necessary forms and envelopes by application to the Chief Signal Officer, United States Army, War Department, Washington, D. C. The United States reserves the right to reject any and all proposals.

Bidders the bidders are also the manufacturers of the flying machine they must state the name and place of the maker.

Performance.—This specification covers the construction of a flying machine supported entirely by the dynamic reaction of the atmosphere and having no gas bag.

Acceptance.—The flying machine will be accepted only after a successful trial flight, during which it will comply with all requirements of this specification. No payments on account will be made until after the trial flight and acceptance.

Inspection.—The Government reserves the right to inspect any and all processes of manufacture.

GENERAL REQUIREMENTS.

The general dimensions of the flying machine will be determined by the manufacturer, subject to the following conditions:

1. Bidders must submit with their proposals the following:
   (a) Drawings to scale showing the general dimensions and shape of the flying machine which they propose to build under this specification.
   (b) Statement of the speed for which it is designed.
   (c) Statement of the total surface area of the supporting planes.
   (d) Statement of the total weight.
   (e) Description of the engine which will be used for motive power.
   (f) The material of which the frame, planes, and propellers will be constructed. Plans need will not be shown in other bidders.

2. It is desirable that the flying machine should be designed so that it may be quickly and easily assembled and taken apart and packed for transportation on army wagons. It should be capable of being assembled and put in operating condition in about one hour.

3. The flying machine must be designed to carry two persons having a combined weight of about 350 pounds, also sufficient fuel for a flight of 125 miles.

4. The flying machine should be designed to have a speed of at least forty miles per hour in still air, but bidders must submit quotations in their proposals for cost depending upon the speed attained during the trial flight, according to the following scale:

40 miles per hour, 100 per cent.	
39 miles per hour, 95 per cent.	
38 miles per hour, 90 per cent.	
37 miles per hour, 70 per cent.	
36 miles per hour, 60 per cent.	
Less than 36 miles per hour rejected.	
41 miles per hour, 110 per cent.	
42 miles per hour, 120 per cent.	
43 miles per hour, 130 per cent.	
44 miles per hour, 140 per cent.	

5. The speed accomplished in accordance with paragraphs 3 and 4 must be maintained for a continuous time over a measured course of not less than five miles, the machine to be under its own power and in a flying start, passing the starting point at full speed. Bidders must submit with their proposals such additional details as the Chief Signal Officer may require.

6. Before acceptance a trial endurance flight will be required. [illegible] the flying machine must remain continuously in the air without landing. It shall return to the starting point and land without any damage that would prevent it immediately starting upon another flight. During this trial a speed of one hour it must be steered in all directions without unusually sharp curves under perfect control and in equilibrium.

7. Three trials will be allowed for speed as provided for in paragraphs 4 and 5. The trial for endurance as provided for in paragraph 6, and both tests must be completed within a period of [illegible] days from the date of delivery. The expense of the tests to be borne by the manufacturer. The date of delivery to the Government and trial flights will be at Fort Myer, Va.

2

8. It should be so designed as to ascend in any country which may be encountered in field service. The starting device must be simple and transportable. It should also hold to a light without requiring a specially prepared spot and without damaging its surroundings.

9. It should be provided with some device in front of the operator to protect him against the [illegible] propelling machinery.

10. It should be sufficiently simple in its construction and operation to permit an intelligent man to become proficient in its use within a [illegible] instruction.

11. It should be sufficiently strong and portable to be taken apart and packed in a wagon for transportation. It should be capable of being assembled and put in operating condition in about one hour.

12. Bidders must furnish with their proposals a certified check upon a solvent bank for [illegible] per cent of the bid, which will be forfeited to the United States as liquidated damages in the event that their proposal is accepted and they fail to enter into contract for furnishing the machine called for by their proposal. Certified checks will be returned to unsuccessful bidders as soon as practicable after the awards are made. The check of the successful bidder will be returned when the machine has been delivered and accepted.

13. Bidders will state the price for which they will sell the machine, including the services of a competent aviator to instruct one person in its operation sufficiently to operate it without assistance. Bidders will also state the price for which they will sell additional machines of the same model, and the time required for delivery after receipt of order.

14. Bidders must state the time within which they will be required to begin instruction after the delivery of the machine, and the number of days which will be required for such instruction. No additional charge for this instruction will be allowed. Bidders will also state the price for which they will furnish a duplicate machine, including the price of instruction of [illegible] handling and operating the same, and the time required for delivery after receipt of order.

JAMES ALLEN,
Lieutenant General, Chief Signal Officer of the Army.

SIGNAL OFFICE,
WAR DEPARTMENT,
Washington, D. C., November 23, 1907.

STILL A MUST...

HEADQUARTERS
UNITED STATES ARMY MATERIEL COMMAND
WASHINGTON, D.C. 20315

AMC Pamphlet 385 - 71 **May 1966**

The Safety Digest is an AMC Pamphlet prepared by the Safety Division, Headquarters, U. S. Army Materiel Command. Its purpose is to disseminate information which can materially influence and improve safety programs at all Command establishments.

Articles are included to supplement technical knowledge as well as practical knowledge gained through experience. They provide a basis for the further refinement of safety measures already incorporated in operating procedures and process layout. To achieve maximum effectiveness, the Safety Digest should be given widespread circulation at each AMC establishment.

Articles appearing in the Safety Digest are unclassified and are not copyrighted. They may be reproduced as desired in order to bring pertinent accident prevention information to the attention of all employees. The Army Materiel Command Safety Digest should be given a credit line when articles are extracted.

Unclassified material believed to be of interest or benefit to other establishments is welcome for publication in the Safety Digest. Please send articles for review to: U. S. Army Materiel Command Field Safety Agency, Charlestown, Indiana. If possible, include pictures, charts, drawings, and illustrations that clarify and heighten interest in your presentation.

SELWYN D. SMITH, JR.
Major General, USA
Chief of Staff

OFFICIAL:

STANLEY J. SAWICKI
Colonel, GS
Chief, Administrative Office

IN THIS ISSUE

A CH-54A "FLYING CRANE" SHOWN FERRYING A DISABLED CV-2 . . . . . Front Cover
BUILDING T-7 AND NATIONAL AIRPORT, WASHINGTON, D. C. . . . . Inside Front Cover
1907 SIGNAL CORPS SPECIFICATION FOR US ARMY AIRCRAFT PURCHASE . . . . . Facing Page
FOREWORD I
IN THIS ISSUE II

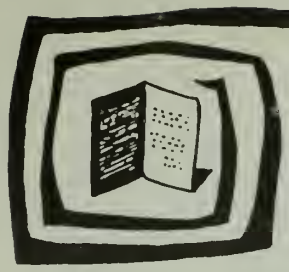
FY 1967 AMC SAFETY SCHOOL COURSES 1
AVIATION SAFETY 2
SPECIAL TOOLS FOR FIELD SUPPORT OF COMBAT VEHICLES 4
BALANCE AND FREE HANDS CAN PREVENT FALLS 5
TAKING A TRIP? 6
WATCHFULNESS CAN REDUCE MOWING HAZARDS 7
FIRE SAFETY PROGRAM ELEMENTS 9
HAVE YOU TAKEN THE PLEDGE? 11
HAZARDS OF ORGANIC PHOSPHOROUS PESTICIDES 12
CHILDREN AND TRAFFIC SIGNALS 19
A BOMB AND A MULE 20
CURRENT EVENTS
- FOOT MOVEMENT YIELDS BROKEN FINGER 21
- SOFT SHOULDER UPSETS PARKED TRAILER 22
- THE LADDER RESTED ON POLISHED TILE 23
- BACKLASH WAS UNFORESEEN 23
- THREE-TON LOAD ROLLED ON 24

EXPLOSIVES SAFETY
- REMOTE CONTROL EXPLOSIVES MACHINING AT PICATINNY ARSENAL 25
- ARE YOUR TESTS UP-TO-DATE? 28

DO YOU KNOW? 29
AWARDS OF HONOR CEREMONIES - FY 1965 31
AMC AWARDS OF MERIT CEREMONIES - FY 1965 32
INJURY-FREE PERFORMANCE AWARDS 33
WELL, DID YOU KNOW? 34
REFERENCE PUBLICATIONS 35
REQUIREMENT FOR MOTOR CARRIERS TO CARRY TWO FULL EXTINGUISHERS SECURELY MOUNTED TO VEHICLE 36
NATIONAL SAFETY COUNCIL AWARD NOTIFICATIONS 36

Digitized by the Internet Archive
in 2016

https://archive.org/details/safetydigest1966wash_1



FY 1967

AMC SAFETY SCHOOL COURSES

The AMC Safety School has scheduled eighteen classes in seven subject areas for presentation in FY 1967. These courses will be held at the AMC Field Safety Agency, Charlestown, Indiana, between 29 August 1966 and 19 May 1967.

Details concerning the school and the content of the courses are available in the FY 1967 brochure. This publication was mailed in February 1966 to all AMC commands, installations, and activities.

The AMC Safety School schedule for FY 1967 includes the following courses:

1. Introductory Safety - One class
2. Industrial Safety - Four classes
3. Munitions Safety - Five classes
4. Guided Missile and Rocket Safety - One class
5. Motor Vehicle Safety - Three classes
6. Nuclear Weapons Safety - One class

The Industrial Safety and Munitions Safety classes last two weeks each. All other courses require one week each.

The subject matter taught in the AMC Safety School is revised continually to incorporate information on the latest technical developments that affect the safety of AMC personnel and property.

The demand for spaces in AMC Safety School courses is so great that all FY 1967 classes are expected to be filled to capacity.

Spaces for the FY 1967 classes are scheduled to be allocated on 16 May 1966. Information on the allocations made will be furnished AMC commands, installations, and activities for their use in scheduling attendance by their personnel.

• AVIATION SAFETY

R. J. Shirock
Safety Director
U.S. Army Mobility Command

Since the beginning of time, man has looked up and wanted to fly. In the early days, attempts to imitate the birds were both hilarious and tragic. In the 16th Century, in France, men were able to rise above the earth by the use of balloons filled with hot air. Despite the many failures,their attempts persisted. Finally the first recognized sustained flight was performed by the Wright brothers at Kitty Hawk, North Carolina.

Army aviation began almost at once, when the Army purchased one aircraft and began flying.

On 28 February 1914, the first aviation summary was published by the Army. The report covers the time period from 17 September 1908 through 9 February 1914. These statistics are contained in the report: eleven accidents resulting in the death of twelve commissioned officers, one non-com and one civilian -- nine pilots (eight military, one civilian) and five passengers. One of the injured was Orville Wright who suffered a broken leg during an Army airplane test flight of the original Wright brother's design.

It is interesting to note that in nine of the eleven accidents, pilot error was listed as the causative agent. DA Forms 2397 indicate that the proportion of aircraft accidents caused by pilot error is almost the same today.

Army aviation is on the move with more planes, bigger planes and higher performance planes. All are designed to help the Army Commander accomplish his mission.

The type of flying done by Army aviatiors increases the accident potential. Examples include nap of the earth flying, and landing in any open area under all weather conditions.

Aviation accident prevention is a command responsibility that must be included as a part of the over-all installation safety program. Efforts must include clearly defined objectives and policies that give proper consideration to all facets of aviation safety.

Staff, supervisory, and operational personnel are directly responsible for the conduct of an accident prevention effort. Many accidents are the direct result of inadequate direction and control in the chain of responsibility. Inadequacies are of primary concern since they indicate an operational weakness that detracts from mission accomplishment and they require corrective actions.

Unfortunately, most of the publicity involves the installation that has aviation accidents. Too little is said about the aviation section that performs its mission without incident. The accident-free unit is not just lucky. Its personnel work hard at safety. It success in preventing accidents is due in large part to the strong support of its Commander. That Commander has assured that each and every one of his people in a supervisory capacity is giving the same support to the aviation safety program that is given to the installation safety program.

A qualified Aviation Safety Officer must be appointed within each unit that has organic or attached aviation activities. The Aviation Safety Officer reports directly to the Commander on all matters involving aviation safety and serves as a technical consultant to the Safety Director in matters relating to the Aviation Safety Program.

An Aviation Safety Program must include but not be limited to the following elements:

1. Aviation safety meetings
2. Aviation safety promotional activities
3. Flight safety
4. Ground safety
5. Pre-Accident plan
6. Crash plan guide

The high dollar value of the present day Army aircraft, the complexity of these aircraft, and the critical need for pilots make aviation accident prevention a must for the Commander. The inclusion of aviation safety in the overall installation safety program is a "natural." It will pay big dividends in safety.

SPECIAL TOOLS FOR FIELD SUPPORT OF COMBAT VEHICLES

P. Fogle
Combat Vehicle Division, Maintenance Directorate
U.S. Army Tank-Automotive Center

The trend in field maintenance support of combat vehicles is to provide more and more repair by replacement of modules and components rather than to make repairs while the assemblies are on the vehicles. This concept requires rapid removal and replacement under less than ideal conditions. Many of the items to be replaced are heavy, awkwardly shaped and in relatively inaccessible locations.

Safety must be given serious consideration because field conditions lend themselves to practices and to locally fabricated tools that are unsafe. In the field the loss of a man from an unsafe practice or unsafe equipment is no less serious than the loss of a man from enemy action. It may be more demoralizing.

To assure the best field maintenance practices possible, attention to the safety program must begin with the vehicle design. The following are among the criteria that should be considered:

1. Any component which weighs fifty pounds or more is too heavy for convenient removal and replacement by hand.

2. Items which are not conveniently shaped must be provided with accessible lifting eyes or have tapped holes to receive lifting eyes.

3. Edges of accesses should be beveled or otherwise protected to prevent injury.

4. Heavy items must have centers of gravity clearly shown to prevent tilting when lifting occurs.

5. Where necessary, special handling tools should be provided.

6. Instructions must be disseminated to assure that rigging and mechanical handling will be accomplished with due regard to markings. Such instructions are always a part of the introduction of any new equipment.

The effectiveness of these measures is checked at the time of the maintenance evaluation and again during the service tests of the vehicle. In the maintenance evaluation the

entire vehicle is torn down, utilizing the tools peculiar to each level of maintenance. Where the teardown indicates a lack or inadequacy of a tool, corrective action is immediately initiated. An old tool is changed or a new one is introduced. Often a part is redesigned to eliminate the need for a special tool or special handling instructions. During service testing the special tools and equipment are evaluated by troops who will use them. Shortcomings are immediately reported. These often result in redesign of either the tools or the parts.

The importance attached by the Army to special lifting and handling equipment for field support level is shown by the kind and extensiveness of the special tool list for M107 and M110 self-propelled artillery weapons.

BALANCE AND FREE HANDS CAN PREVENT FALLS

Edward C. Kinker
Mechanical Division, Mechanical Department
U.S. Army Engineer Research and Development Laboratories

When an acrobat performs on a tight rope he uses his arms and hands to balance himself. Should he suddenly lose his balance he can catch the rope with his hands as he falls and prevent serious injury.

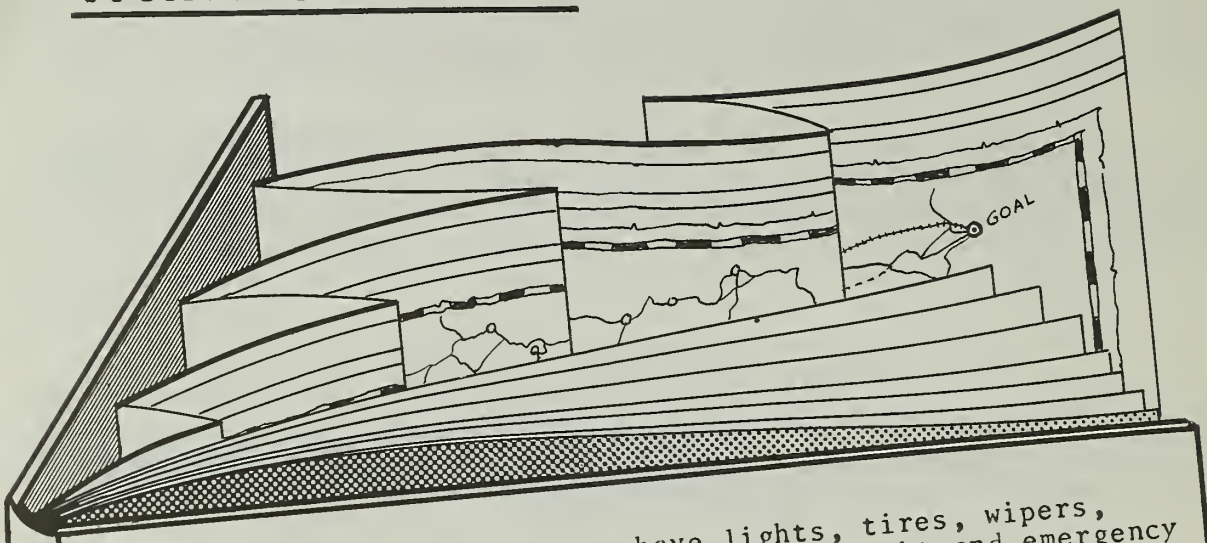
Though few of us are acrobats, the opportunity for falling is constantly present in our lives.

In our daily tasks, be it on a construction job, in the office, or at home, we should keep our hands free, maintain our balance and be mentally alert. When we do this, we have a better chance of preventing a serious injury from being caused by a sudden slip or by suddenly becoming unbalanced.

If, for example, you should climb onto machinery, use the hand holds. Use both hands. Do not attempt to carry an object such as a wrench in one hand when climbing. Should you be working in a wet or muddy area, make an attempt to remove the mud from your footwear before climbing aboard. Mud acts like a lubricant, especially on metal surfaces. Such a slippery situation can cause one to slip, become unbalanced and fall.

We are blessed with two good hands. Do not be vain or careless. Use them appropriately for your personal safety.

• TAKING A TRIP?



If you plan to go by car, have lights, tires, wipers, steering, and brakes checked. Pack a flashlight and emergency equipment. Get seat belts if you don't have them.

Study the map of the route you plan to take and make a mental survey of the driving conditions to expect. Driving situations may be different from what you are used to. For example, indecision on a freeway can cause a pile-up. Be prepared for different driving situations and conditions so that you can practice defensive driving all the way.

Load the car sensibly. Don't take more than you need. Remember a heavily loaded car demands more driving caution. Don't obscure your vision by improperly loading the inside of the car.

Allow plenty of time for the trip. Stop frequently for rest periods. Swap driving duties if other licensed drivers are along. Avoid distractions. Stop to read the map, mind children, or swat a bee. There are plenty of road-side rest areas along most U.S. highways, so stop to refresh yourself and your passengers.

Leave in plenty of time to get there and to return home at a safe and sane speed. Check the car again before leaving for home.

- Safety Program Supplement -
Home and Outdoor Safety
Thiokol Chemical Corporation
Huntsville, Division

WATCHFULNESS CAN REDUCE MOWING HAZARDS

The power mower is one of the most dangerous machines used about the average home. Each year it is the source of a large number of injuries. Most of these could be prevented by a little thought and watchfulness on the part of mower operators.

Here are twenty common-sense suggestions of ways to make power mower operation safer. Application of them by all AMC personnel should keep them on the job, and prevent injuries, or perhaps loss of life:

1. Make certain your lawn is clear of loose stones, bones, metal, glass, and wood before you start your mower. These can become missiles that kill when the mower blade picks them up.

2. Insist that spectators move out of the area being mowed. They may be your victims if you have failed to pick up any loose stones or other debris.

3. Be sure the lawn is level before you start to mow. Damage to the mower blade, the machine, or the operator may result from the blade striking an elevated place. A little work with a lawn roller may be needed.

4. Mow the grass only when it is dry. Wet grass adds to the danger of slipping and foot contact with the blade. It may mat inside the guard, adding to the temptation to get fingers near the moving blade. Moisture adds to the danger of electrocution or shock if you are using an electric mower.

5. Wear sensible clothing, including safety shoes if you have or can secure them. Shoes with soles that reduce the danger of slipping on grassy surfaces are desirable.

6. Make certain that you are thoroughly familiar with the operation of your mower. Besides learning how to start it, before you start to mow know how to operate its controls and to stop it. Read and follow the manufacturer's directions.

7. Make certain the mower is in a sound mechanical condition, with guards in place and controls that operate.

8. Make sure the blades are sharp, balanced, unbent, and protected by guards that extend below them.

9. If you use an electric mower, make sure that the frame is grounded through the cord. A three-wire flexible cord, in good condition, with three-pronged plugs and receptacles should be used.

10. Be careful not to cut the cord when you are operating an electric mower. Cutting the cord may expose you to a dangerous electrical shock.

11. Fuel the motor only when it is cool and is not running. Gasoline vapor plus a hot motor can equal fire.

12. Fuel the mower from Underwriters' Laboratory-approved containers. Fuel that is carelessly dispensed from inadequate containers or improperly stored is a source of fire hazard.

13. Make certain you are standing on a firm footing when you try to start the motor. Keep your hands and feet away from the blade and all other moving parts at all times.

14. Operate the mower at its slowest effective operating speed. This is the safest speed. The other members of your family and your neighbors may appreciate the lower noise level.

15. Mow sloping surfaces from side to side. When you push the mower up the grade, it may roll back upon you if you slip. If you push it down the grade, your foot or hand may get underneath the blade if you slip.

16. Keep the mower under control. If it pulls you along, a dangerous machine has become your master.

17. Stop the motor if you move the mower from one area to another. Loose objects that may become missiles are likely to be encountered if you mow across or down a path or driveway.

18. If you must leave the mower for any reason, stop the motor.

19. Remember that a riding mower is a small tractor, with an additional set of hazards. It may overturn, crush and cut you if you try to operate it on a steep slope.

20. Proceed with great care whenever you repair or adjust the motor and the blade. The parts become hazardous when they move.

● Can you keep your personnel unharmed and on the job by persuading them to practice these easy accident prevention rules?

FIRE SAFETY PROGRAM ELEMENTS

(The following basic fire safety program elements appeared in the Federal Fire Council Committee September 1965 report, Federal Fire Experience for Fiscal Year 1964.)

Recognizing that we can learn from the past, a review was made of Federal fire loss experience for several years. It was found that the absence of basic elements, necessary to any successful fire safety program, repeatedly appeared as the reason behind fire incidents or significantly increased their severity. The following elements should be integrated into every agency's fire safety program:

1. Plans and specifications for new construction, alteration, modifications, and additions should include all economically practicable fire safety features in accordance with standards of the National Fire Protection Association and other nationally recognized standards.

2. Periodic testing and maintenance procedures should be established and performed for all fire safety equipment to insure its proper operation when needed. Procedures should include such equipment as fire extinguishers, automatic sprinkler systems, fire detection, and alarm systems, and water supplies for firefighting.

3. Fire safety responsibilities and authority should be clearly assigned, at all echelons of an agency, to appropriate personnel--preferably on a full-time basis. Assignments should include prescribed functions and procedures to avoid misunderstandings and eliminate gaps in coverage. Sufficient trained personnel should be available to implement the program.

4. Regular, scheduled, detailed, fire safety inspections of agency facilities should be conducted to detect potential fire loss situations, either to life or property, and to insure that necessary corrective measures have been initiated or completed to prevent injury or death to personnel and to minimize property loss from fire.

5. All employees, including those newly hired, should be given indoctrination and training in fire safety fundamentals. Periodic retraining is desirable. Fire safety facts all personnel should know include:

a. The need for prompt reporting to proper authorities of all fires, regardless of size.

b. How to report a fire. The location of the nearest fire alarm box and the number to telephone to report a fire.

c. The method of sounding the alarm and alerting all other occupants of the building.

d. The evacuation signals for the building or area and how and when to evacuate.

e. The location of exits and evacuation routes to be used, including alternates in the event the regular ones are inaccessible.

f. The location of the nearest fire extinguishers and other fire protection devices - when and how to use them.

6. An educational program in off-the-job fire safety should be provided so that agency personnel may carry home fundamentals for the protection of themselves and their families.

7. An effective program for gathering facts and figures on the agency's fire loss experience is essential. Fire loss experience can be used in many beneficial ways. These include: measuring overall effectiveness; disclosing trends and discovering trouble areas; a management medium stressing the waste in manpower and resources from fire; providing a basis for the formulation of suitable educational material; and identifying the causes of fires so that suitable changes can be made to prevent similar future fires. Some of the essential elements of a good fire reporting program are listed below:

a. Definite reporting requirements and procedures known to all.

b. Complete yet concise reporting. Short reports, but with sufficient information to enable recognition and evaluation of the problems represented by the fire occurrence.

c. Reports required for all fires, including no-loss fires (though the reporting procedure may be greatly simplified for the latter.) The proper functioning of installed fire protection equipment can limit or prevent loss due to fire. Reports of no-loss and low-loss fires would spotlight the successful operation of this equipment. This information could then be used to assist in justifying and highlighting the benefits of installed protection. In addition, reports of these fires will help identify causes of fires. With large loss fires it is sometimes very difficult to accurately determine the cause.

d. Complete detailed investigations by competent personnel of large-loss fires, fires of unusual circumstances, and fires causing death(s) or major injuries. These investigations can be of material assistance in determining program deficiencies.

e. Prompt and timely circulation of the results of the fire investigation reports to all interested persons. In addition, circulation of these investigation reports to other Federal agencies may benefit other agencies.

f. Assignment of dollar values to all fire losses. Where this information is not readily obtainable, intelligent estimates should be assigned. Monetary losses establish a common ground of understanding.

g. Determination of the total costs of fires, including loss of operational capacity, injury, and death benefits paid, tort claims, etc.

h. Establishing the exact cause of death resulting from or during a fire, such as burns, asphyxiation, heart attach, or other causes.

* * *

• HAVE YOU TAKEN THE PLEDGE?

If more of us would take a safe driving pledge such as the one that has been used in Michigan --- and live up to it --- there would be a tremendous decrease in the number of motor vehicle accidents.

This is the Michigan Safe Driving Pledge:

"I, _____, hereby give my solemn promise to drive to the best of my ability and in accordance with good driving practices and traffic laws. I promise further to live up to the obligations of the driver's license which grants me the privilege of driving only so long as I obey the rules of the road. I shall always be mindful of the fact that the life I save may be -- a loved one, a friend, a neighbor, or my own."

_____
(Signature)

-- U.S. Army Tank Automotive Center

HAZARDS OF ORGANIC PHOSPHOROUS PESTICIDES

Over the past few years, many persons have been poisoned, some fatally, by the careless or improper use of organic phosphorous pesticides, which are related to the much publicized, but never used, "nerve gases." These pesticides are among the most effective ever devised, and have been a major factor in the productivity of American agriculture. Some of them are also in use as home and garden insecticides. Because most are quite toxic to humans and animals, their use deserves the utmost care.

All of these organic phosphorous compounds have similar chemical structures and also similar effects but they differ widely in the degree of hazard they present, due to such factors as the different ways they are used, rates of absorption into the body, rates of breakdown or elimination from the body, in addition to the actual degree of chemical toxicity. The speed with which effects occur after exposure also varies greatly. Some will cause severe symptoms within a few minutes or an hour of exposure, while others may be delayed several hours in their effects.

The organic phosphorous compounds may enter the body in one of three ways: by mouth (ingestion), by direct absorption through the skin, or by breathing. Any of the three modes of entry can result in serious poisoning and, in many cases, more than one will occur from a single exposure. Most persons are aware of the danger of swallowing or breathing insecticides, but the possibility of absorbing a poison through the skin is not so familiar. This path is one that has been responsible for a great many poisonings from the organic phosphorous compounds. It is not necessary to have a break or irritation of the skin for these compounds to pass, but such breaches in the body's defenses will increase the rate of absorption. Unlike many other toxic materials, the organic phosphates do not cause irritation or damage to the skin, and so spills may easily go unnoticed and uncared for unless the user knows of the danger. Since these compounds are not readily soluble in soap and water, they are not easily removed by washing.

The action of the organic phosphates upon the body is specific and very nearly unique. In otherwise healthy persons able to work, this action termed cholinesterase inhibition, is a clear sign of poisoning with an organic phosphorous compound. Certain liver diseases also produce cholinesterase inhibition, but a person so afflicted would be unable to carry on active work.

Cholinesterase is a natural enzyme, or catalyst of the

body essential to the functioning of the nervous and circulatory systems. Organic phosphorous compounds react with this enzyme and prevent it from carrying out its job.

The cholinesterase enzyme is involved in the chemical cycle of the nerve cell. When a stimulated nerve cell operates, it chemically produces a pulse of energy, which stimulates another nerve cell farther along and the cycle is repeated, transmitting the impulse along the nerve line. A by-product of this chemical reaction in the cell is called acetylcholine. Although a natural product of the body, it is poisonous and if it accumulates beyond a certain point, normal functions of the nervous system are blocked. This is prevented by the cholinesterase, which converts the acetylcholine into relatively innocuous substances.

A slight exposure to an organic phosphorous compound will not produce a reaction, as the body usually has a sufficient reserve of cholinesterase to permit normal nerve function while the organic phosphorous compound is decomposed or eliminated from the body. It is the massive doses or the repeated lower level dose that depletes the cholinesterase reserve which must be avoided. Bad effects are dependent upon the rate of depletion as well as the level of depletion of cholinesterase.

The usual symptoms of poisoning are headache, giddiness, nervousness, blurred vision, weakness, nausea, cramps, diarrhea, and chest discomfort. Signs include sweating, miosis (very contracted pupils), excessive secretion of tears, saliva, and mucous, vomiting, blue skin color (cyanosis) and muscle twitching. In advanced cases there may be convulsions, coma, loss of reflexes, and loss of control of sphincter muscles.

Occurrence of any of the above symptoms within twelve hours of exposure to organic phosphorous insecticides is sufficient reason for calling a physician at once. The common antidote (atropine) may have such serious effects that it should be used only by a physician.

Several of the more important organic phosphorous pesticides are discussed in the approximate order of the hazard they present in their usual or common uses.

● Parathion is formulated as a fifteen- and twenty-five-percent wettable powder, in concentrates of fifty-percent or less for emulsions, and as dusts and ready-to-use preparations containing five percent or less. It is also available as a ninety-eight-percent technical grade powder, and aerosols up to ten-percent concentration. Parathion is very toxic if taken by mouth, and is very readily absorbed through the skin. Most of the serious cases of poisoning have arisen chiefly or partly

through skin contact. Inhalation of the material is also an important source of poisonings. Aerosol preparations are especially dangerous in this respect.

Many of the deaths caused by Parathion have resulted from the effects of splashes on the skin. Serious and sometimes fatal exposure arises from contact with sprayed vegetation or contaminated articles. Children seem to be more susceptible to the effects of Parathion than do adults. Records indicate that serious and often fatal cases have occurred from the manufacture, shipment, formulation, application, and contact with vegetation after application and contact with use containers. This seems to be the most hazardous of all organic phosphates and is taken as a standard in rating the others.

● Demeton is formulated in twenty-five-percent concentration for emulsions. Used on plants, it is absorbed throughout, making all parts toxic to sucking insects. Taken by mouth, Demeton is about as hazardous as Parathion. Skin absorption is apparently somewhat less than with Parathion, but it is still a very serious danger. Breathing the material is regarded as a serious hazard. The overall effects of Demeton are not significantly different from those of Parathion.

● TEPP is available as a fifty-percent concentrate in organic solvents, in emulsions up to zero point four percent, aerosols from zero point five to four percent, and dusts up to two percent. TEPP is used much like nicotine, for aphids and other soft-bodied insects. It is also applied as a fly control agent, sometimes in a bait mixed with Lindane, a chlorinated insecticide of rather high toxicity. If ingested, TEPP has a rapid and highly toxic action. It is readily absorbed through the skin, and breathing it is also an important poisoning mechanism. Early poisonings may be confined to the respiratory system, especially when exposure is primarily to dusts. In addition to the characteristic effects of the group, there is a more pronounced effect on the eyes and the respiratory system, especially when exposure is primarily to dusts. In addition to the characteristic effects of the group, there is a more pronounced effect on the eyes and the respiratory system. The effects of direct contact with the eyes include tears, a burning sensation, blurred vision, and miosis (contracted pupils). These symptoms may occur without any other noticeable indication of poisoning and indicate the need for prompt medical attention.

● Diazinon is supplied as a ninety-percent powder and a twenty five-percent wettable powder, a four-percent dust, a twenty-five-percent emulsion, and in poison baits. It is used largely against flies, roaches, and fruit and vegetable insects. If ingested, it is regarded as moderately toxic. It is readily absorbed through the skin and is moderately toxic in such instances. Breathing it can also be a severe hazard. Diazinon

is more hazardous than is sometimes considered. The illness resulting from poisoning seems to be more prolonged than with most other organic phosphorous compounds.

● DDVP is available in baits, as concentrates, and in aerosols in pressure cans. It is used against houseflies, Mediterranean fruit flies, and warehouse pests. Because of the high concentrations that may result from the high volatility of the chemical, breathing it is a relatively more serious hazard than are ingestion and skin absorption. Although it passes readily through the skin, it is regarded as only moderately toxic in this exposure. The worst effects are usually felt within an hour, as the chemical is changed rather quickly to a much less toxic form in the body.

● Phosdrin is supplied as twenty-five- and sixty-percent concentrates, twenty-five-percent emulsion, one- and two-percent dusts and granules, and a twenty-five-percent wettable powder. It is used as a general insecticide. Taken by mouth, it is extremely toxic. Phosdrin is readily absorbed through the skin and produces its effects rapidly. The most easily noticed effect is on the eyes. There is an especially quick development of miosis.

● Phorate is impregnated into carbon in a concentration of fourty-four percent. It is used in the treatment of cotton and legume seeds. With reasonable care, hazardous exposures can be avoided. It is, however, highly toxic, the effects being typical.

● Guthion is formulated as a twenty-percent emulsion, a twenty-five-percent wettable powder, and a three-percent dust. It is used for a wide variety of plant pests. Taken by mouth, Guthion is very toxic, similar in its effect to Parathion. Toxic effects resulting from absorption through the skin are appreciably lower than those of other organic phosphorous pesticides. The lower incidence of poisonings is probably due to this. The overall effects are similar to Parathion.

● Co-Ral is supplied as a twenty-five-percent wettable powder, and a five-percent dust. It is used as a spray or dip for cattle, sheep, goats dogs, and chickens. If ingested, its toxicity is delayed and is more prolonged than with most other organic phosphates. The effects resulting from absorption through the skin are low. Except for its delayed action, the toxicology of Co-Ral is similar to the others of the group.

● Methyl Parathion is available as a seventy-percent-solution, twenty-five- and fifty-percent emulsions, and a twenty-five percent dust. It is used as a general insecticide against plant pests. Taken by mouth, it is moderately toxic; absorbed through the skin, it is definitely less toxic than Parathion. The effects are much like the others but of lesser degree.

● Schradan is supplied in sprays and aerosol bombs, from seven- to forty-two-percent concentrations. This is an insecticide absorbed by plants to control sucking insets. It is of low toxicity when ingested. The effects are typical of the group, but accidental poisonings can be easily avoided.

● Trichlorofon is formulated as one-percent bait for flies, fifty-percent wettable powder, and five-percent dusts and granules. It is used for fly control in dairy barns. It is also effective against roaches and plant pests. Taken by mouth, the toxicity is relatively low. It is readily absorbed through the skin, but again is of low toxicity. The effects are the same as the others, except for the lower degree of toxicity and a quick recovery from the symptoms.

● Malathion is available in a technical grade, a twenty-five-percent wettable powder, dusts, solutions, baits, and concentrates for emulsions. It is in common use to protect plants, and is also used against flies and mosquitoes. It is not as readily absorbed through the skin as many others, which may account for its relatively low hazard. Malathion is also of low toxicity when taken by mouth or when inhaled. The illness resulting from a hazardous exposure is characterized by muscular weakness and, in extreme cases, by unconsciousness. The chemcial is quickly broken down in the body, but some of the products are also toxic. Malathion, therefore, should not be regarded as harmless, merely because relatively few poisonings have been attributed to it.

● Chlorthion, supplied as a fifty-percent emulsion, a twenty-five-percent wettable powder, and a three percent dust, is used against roaches, mosquitoes, and in dairy barns for fly control. Taken by mouth, or absorbed through the skin, Chlorthion is of relatively low toxicity. The effects are those of the group, but much milder than most. This compound, however, should not be considered harmless because of its relatively good record.

The organic phosphorous pesticides may be handled with safety if reasonable precautions are observed.

All persons using these compounds should have a knowledge of their possible effects, and the handling and hygienic procedures required to avoid exposure.

The name of a physician who is familiar with the effects and treatment of poisoning by the specific agents in use should be posted where it is available to workers and supervisors. Advance consultation will permit the doctor to be better prepared to cope with any poisoning. The local Poison Control Center can supply up-to-date information on recognition of specific symptoms and proper medical treatment.

Where organic phosphorous pesticides are to be used extensively, a responsible person should be present who is familiar with the symptoms, and who is prepared to give artificial respiration and other first aid as may be authorized by the consulting physician.

Every reasonable precaution should be taken to prevent exposures. Respirators, goggles, and impervious clothing will provide maximum protection. Operators should be given prior instructions and training in the use of this equipment. Contaminated regular clothing should be removed after completion of each day's work and not worn again until properly cleaned. They should be cleaned separately, and care taken that the person doing the cleaning will not be exposed to the pesticide on them. In some areas, laundries specializing in contaminated clothing can do a superior and safer job. Heavily contaminated clothing should be discarded and burned.

An organic phosphorous insecticide should never be handled directly or mixed with bare hands. If an organic phosphorous pesticide does come into contact with the skin, as might occur in a spill or splash, immediate action should be taken to remove the material immediately. Do not wait until the end of the day or until the job is done. Contaminated clothing should be removed, and affected areas of the body washed thoroughly with soap and water and then swabbed with alcohol to remove the residue. If any symptoms follow, a doctor should be seen at once.

If the insecticide is splashed into the eyes, a physician should be called immediately. The victim's eyes should be flushed with water until the doctor arrives. This is not because of a direct hazard to sight, but rather to reduce the danger of systemic poisoning.

Steps should be taken to protect the public, particularly children, from exposure to organic phosphorous pesticides, both in their use and from residues on vegetation or in empty containers. Manufacturers and Government agricultural representatives can give specific advice on the proper use of any pesticides. Generally, they should be used in the minimum amounts necessary for the purpose, and applied in a controlled manner to reduce general contamination. Storage of insecticides should be in locked buildings, and the empty containers disposed of by burning. While the organic phosphorus compounds are destroyed by burning, care should be taken that no one stands in the smoke of the fire.

The ability of these materials to adhere and their chemical stability and toxicity are all so high that, once applied, potentially dangerous residues may remain on any object contacted for many months, even years. In recent years, there

have been several instances of nonoccupational poisonings, often involving children. In 1963, a case was reported in California where six boys were poisoned by Phosdrin which had been spilled eight months previously on the blue jeans they wore. The spillage had occurred while the clothes were being trucked between cities. During the eight months, the clothes had been stored in an air-conditioned warehouse before being sold. In 1964 in Canada, three children were poisoned by Parathion, which had been spilled on cotton flannelette sheets during shipment from Europe.

John P. O'Neill & G. Walker Daubenspeck
Bureau of Labor Standards

(Much of the material for this article has been drawn from the handbook, "Clinical Handbook on Economic Poisons," U. S. Department of Health, Education, and Welfare, Public Health Service.) Safety Standards

Editor's note: Efforts are made by the Department of Defense to minimize the hazards caused by the misuse of pesticides as follows:

1. Only the less toxic materials are standardized after they have been used by the civilian economy for a reasonable period of time and are of demonstrated safety and effectiveness, i.e., malathion and diazinon are the only organic phosphate pesticides in subject article which are authorized for use on Department of Defense installations. References: SB 3-40, Pesticides and Herbicides, 20 May 1963 and Federal Supply Catalog Identification List, C-6800-IL, FSC Group 68, Chemicals and Chemical Products, 1 January 1966.

2. Concentrated insecticides are authorized for use only by specially trained personnel. Reference: SB 3-40.

3. Personnel engaged in pest control operations are required to possess a valid certificate of training which states in part that the individual has successfully completed training in the approved safety recommendations for application of Department of the Army authorized toxic insecticides, rodenticides, fumigants, and fungicides. Reference: AR 420-76, Repairs and Utilities, Entomology Services, 13 December 1963.

4. Nonstandard pesticides can only be authorized by the operating agency commander. Reference: AR 420-76.

5. The sale and display of pesticides in exchanges are regulated by AR 40-5, Medical Service, Preventive Medicine, April 1964 and Army and Air Force Exchange Service Bulletin No. 78, Sales and Merchandising Criteria, 2 August 1965.

CHILDREN AND TRAFFIC SIGNALS

Does your child know how to read traffic signals properly?

Mrs. Dutchie Riggsby, a teacher in Troy, Alabama, found that twenty out of twenty-three second and third graders did not know how to read a signal properly. They had the mistaken idea that the signal to watch for is the red light on the side of the traffic signal than the green light facing them.

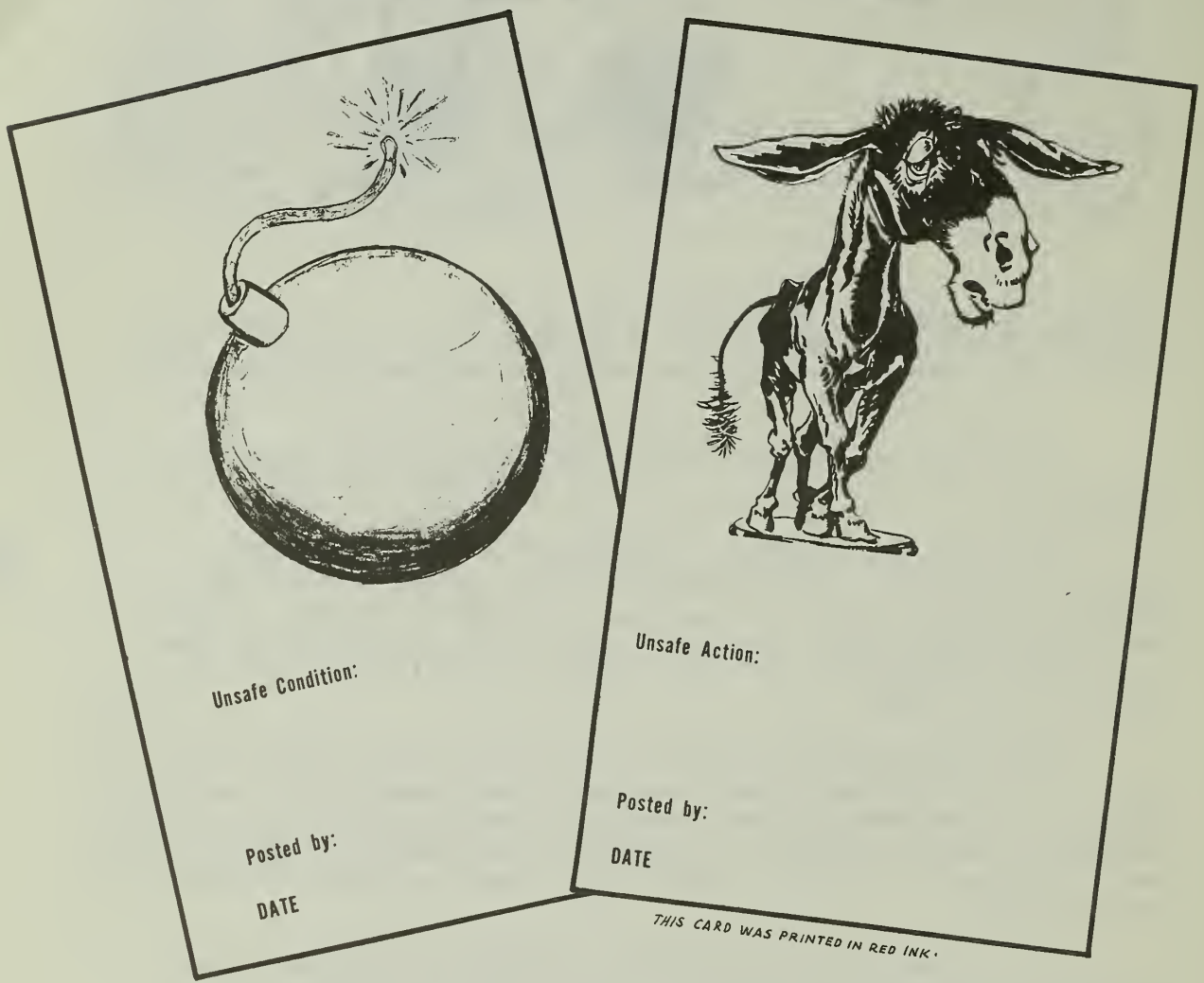
According to Mrs. Riggsby, nearly three-fourths of the children had been taught to misread signals by their parents. For example, Mrs. Riggsby has heard parents tell their children, "Come on, we have to go when the light's red," instead of saying, "Let's go when the light facing us is green."

This advice can be a serious hazard in cities where traffic lights and pedestrian signals are placed on the sidewalk corners of intersections rather than overhead. When the traffic light is on the corner, a child who has learned to go with the red would step out in front of oncoming traffic.

Be sure your child understands that he should GO when the light changes to green and STOP when it is red.

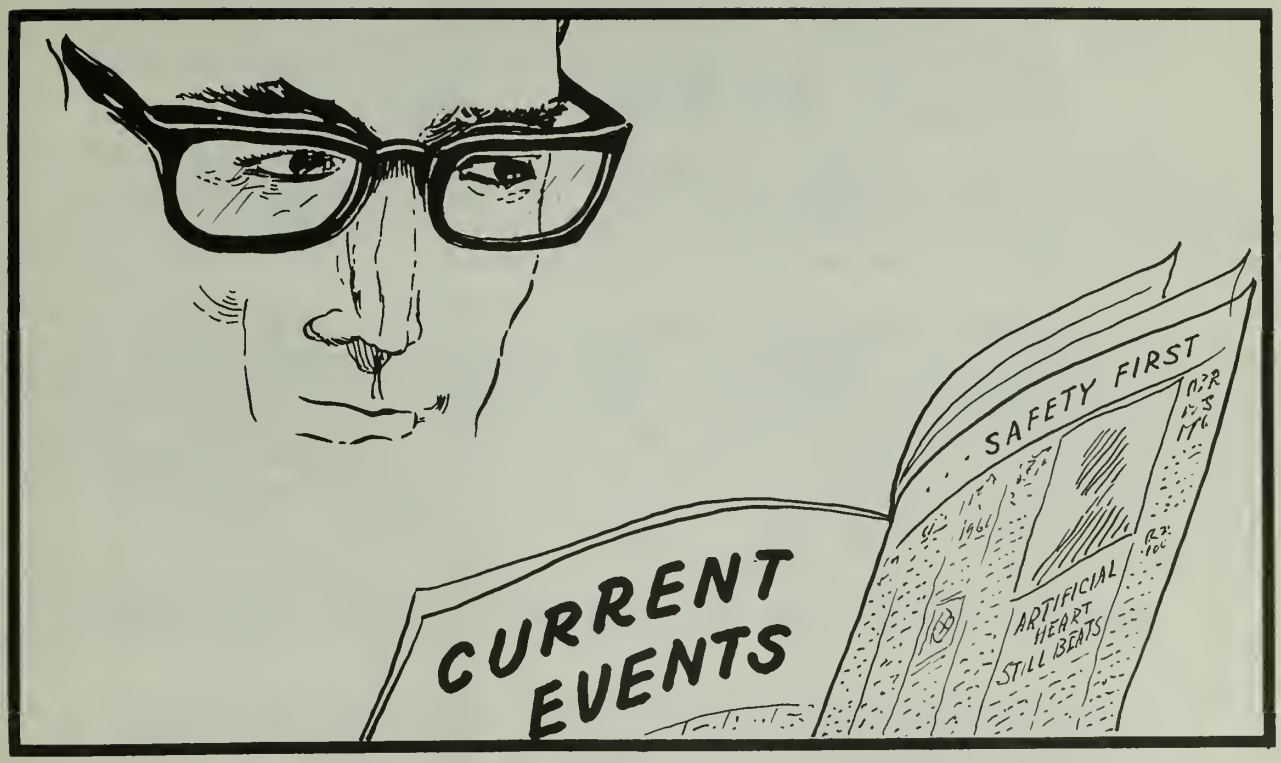
-SAFETY SPEAKS
U.S. Army Engineer District
Vicksburg

A BOMB AND A MULE



These symbols were used recently by personnel of Rohm and Haas Company, Redstone Research Laboratories, Redstone Arsenal, Alabama, in an accident prevention campaign. They are designed to detect and to correct unsafe actions or conditions.

This program was initiated and conducted at the section level by the Chemical Engineering Section. All personnel were asked to point out those unsafe acts/conditions which they observed, by posting the applicable card. Cards could not be removed until appropriate corrective action had been taken or initiated. Upon completion of the campaign the results were discussed in a sectional meeting, and, all things considered, thought to be very worthwhile.



FOOT MOVEMENT YIELDS BROKEN FINGER

An Army employee on an ammunition line operated a machine that ejected a mandrel from a grenade. The manufacturing step that preceded his operation was the removal of the grenades from a pallet. After the worker who did this left the cubicle for a short time, the mandrel ejector operator left his work to remove some grenades from pallets. He then came back and started to resume his own operation.

At this instant he noticed that a pallet containing grenades was being moved out of the cubicle by the conveyor. He tried to operate the pallet stop by depressing the pneumatic foot pedal. In his haste he stepped on the pedal that activated the mandrel ejector. The ejector plunger descended and caught his left hand, which was resting on a grenade. The fourth finger was broken.

The likelihood of smiliar injuries was reduced by substitution of dual hand valves for the foot pedal on the mandrel ejector. To operate the machine the worker must now activate the two hand valves simultaneously. This will prevent him from putting either hand under the moving plunger.

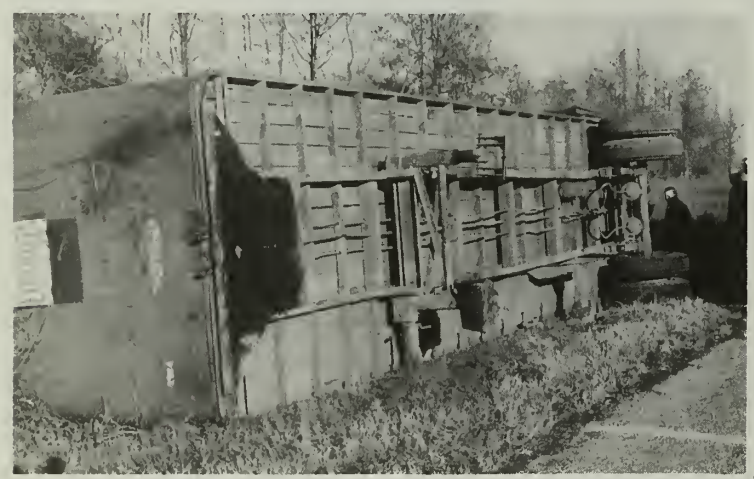
SOFT SHOULDER UPSETS PARKED TRAILER

An Army-owned trailer loaded with 155mm propelling charges had been parked on the side of the pavement near an igloo. One dolly rested on the hard surface of the road and the other on the soft road shoulder.

A contractor employee attempted to connect his tractor to the trailer. He found that the vehicle was not in the proper position for mating with the tractor. He then started to climb down from his cab to adjust the dollies. As he was doing this he saw the dolly on the road shoulder sinking into the ground. This was followed by a noise of the shifting load inside the trailer. The trailer rolled over on its side.

Damage to the trailer was estimated at $450. The cargo was undamaged.

To prevent similar accidents the contractor instructed his drivers to position both dollies on firm earth whenever trailers were spotted.



The Ladder Rested on Polished Tile

It was winter, the hour was early and the day was cool. It was clear that a considerable amount of heat from the work area was escaping through an open trap door space in the ceiling. An Army employee decided to reduce this heat loss before settling down for the day's work.

He secured a piece of cardboard that was large enough to cover the opening. He then moved a sixteen-foot ladder into place and raised its top against the edge of the trap door opening. The legs of the ladder, which lacked rubber safety feet or other antiskid devices, rested on the waxed and polished tile floor of the work area.

The worker mounted the ladder. When he was about six feet up the ladder slipped on the polished tile. The man and the ladder fell to the floor, and the man sustained a compound **fracture** of his right leg.

The installation installed a retractable stairway to the attic. It also took action to make certain that its ladders met the applicable section of its existing safety regulations.

Backlash Was Unforeseen

A contractor employee was helping unload a heavy lathe that had been moved on a flatbed trailer. The machine had been mounted on a wooden pallet, and this had been secured to the trailer by chains. Load binders had been used to tighten the chains.

The worker stood on the bed of the truck and started to loosen the binder by pulling its handle. As the handle was pulled past the breakover point it released the full force the load had exerted against the binder. The handle flew back sharply and struck the employee's leg six inches below his knee. The blow produced a compound fracture of the tibia.

To prevent similar accidents the installation prepared a procedure to govern the use of load binders. The procedure reflected cognizance of the following essentials:

1. The main function of the load binder is to prevent vertical movement of the material it secures. Blocking, not tension on the load binder, should be used to prevent lateral movement.

2. Proper tension can be obtained with the lever arm on the load binder. The use of additional extension bars or pipes to secure load binders should be unnecessary.

THREE-TON LOAD ROLLED ON

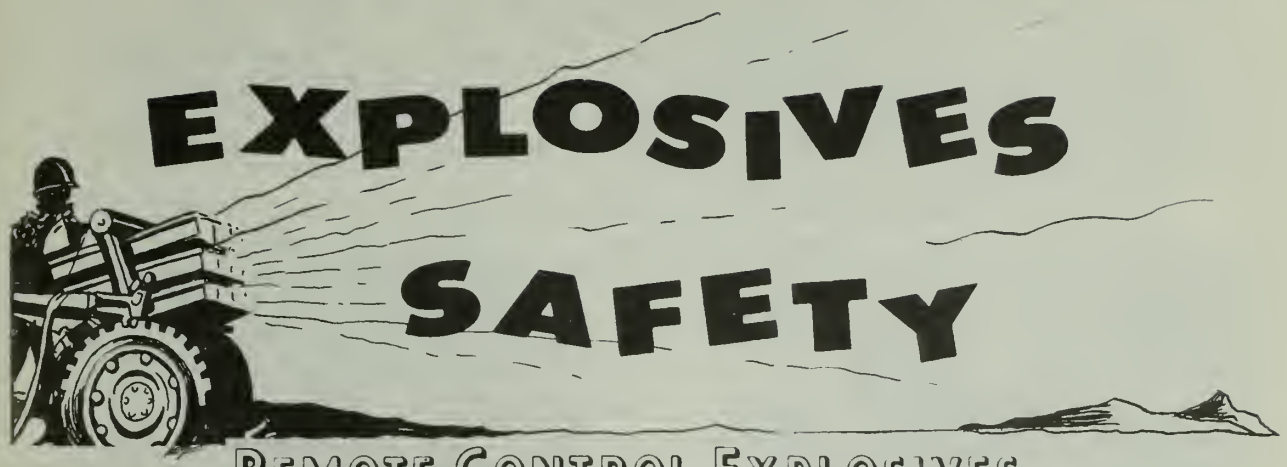
A DeWalt swing saw was located in the nailing section of a box factory. The operator removed lumber as he needed it from a warehouse trailer parked near his saw. When his supply was used up, a fork lift operator would place a new bundle of lumber on a trailer and push it into position.

When the accident occurred the saw operator was guiding a 6,000-pound load of lumber that was being moved into place. The lumber reached its proper position. The operator stopped his truck and backed away from the trailer.

The wheels of the loaded trailer rested on a slight incline in the floor that ran toward a nearby nailing machine. The vehicle rolled slowly down the grade. The operator tried to stop the movement by pushing against the load. Intent on his effort, he forgot his nearness to the nailing machine until the load pinched his arm against its table. The machine was solidly fixed to the floor, and the slow moving load bounced back enough for the man to pull his arm free.

The employee reported to his supervisor and was taken to a hospital. His arm was found to be fractured and surgery was necessary. The time he would loose from work was estimated at sixty days.

The installation started a study to see whether improvements could be made in the box factory floor surface and the method of handling loads of lumber. It also began to use wheel chocks to prevent unwanted movement of loaded warehouse trailers.



Remote Control Explosives Machining at Picatinny Arsenal

S. F. Herzick
Chief, Experimental Explosives Components Division
Industrial Services Directorate
Picatinny Arsenal

In a deceptively quiet wooded area at one end of Picatinny Arsenal a group of engineers and technicians of the installation's Experimental Explosives Components Division, Industrial Services Directorate, machine explosives into intricate shapes with the same finesse employed by their counterparts in the best machine shops.

As a result of this explosives machining, the Army is able to evaluate new types of explosives, make prototype warheads and efficiently perform research and development tasks on projects involving explosive research.

Time-tested explosives such as TNT, Composition B, Octol, and even some of the newer plastic bonded explosives are contact machined. This means that the machine operators conduct their explosives-machining tasks with direct observation and manual control of the various machines. However, technological advances in the weapons systems of the U.S. Army make it mandatory that exploration in new explosives be accomplished on a continuing basis. More Power! Less Sensitive! Heat Resistant! Greater Tensile or Compression Strenght! Crack Free! are only a few of the requirements that the Army Research and Development teams are working on in the field of explosives.

Research laboratory tests are performed on all new or modified explosive compositions. In general the results of these tests predicate whether machining of the explosive can be manually or remotely controlled. If there is the slightest indication of danger, remote control machining is prescribed.

The machining facility of the Experimental Explosives Components Division is located in a modern building. It is compartmented in such a way that should an incident occur at any of the machines only one compartment or bay would be affected. Each compartment has its own roof segment and one blowout wall. Strict safety measures control the weight of explosives on hand in any one area. The number and location of personnel in the area is also rigidly controlled.

Not far from all machining devices is a bunker surrounded by a barricade as a safety measure. In this air-conditioned observation and control post there are five monitors installed in recessed portions of the wall. Two precision camera control units are also similarly installed on the wall. Pan and tilt and zoom controls are consolidated on one panel in an angled desk-type shelf. Here operators not only control movements of the camera accessory units but also remotely control machining and other instruments in the explosive machining bays. A special remote control panel with various switches and push buttons to accomplish this task was designed by Picatinny Arsenal technicians.

In the compartmented bays of the machining area are lathes, milling machines, saws, and drill presses operated by expert machinists.

When there is the slightest element of danger the television cameras are brought into play. There are two cameras in this building. They are either mounted on tripods and moved from bay to bay or are installed in a fixed position on explosion proof pan and tilt units. Both cameras are equipped with Zoomar lens with remote control of zoom, iris, and focus.

Explosion proofing of equipment is accomplished by air purging in accordance with provisions of Article 500, National Electrical Code. Other peripheral equipment employed in the system includes one custom dual video switch assembly, rack mounting, five remote control boxes for the Zoomar, and five remote control panels for the pan and tilt units.

When remote observation and machine manipulation are necessary, an operator and a technician set up the machine and explosive element for control from the isolated bunker previously described. The television camera is then aimed at the machine and explosive portion. For safety at this point the operator and technician move to the protective area of the bunker in order to operate and view the machine on closed circuit television equipment.

Although the element of danger is slight, the possibility of injury to persons in the immediate vicinity of the bay does exist. Thus a foolproof system was introduced by Picatinny

Arsenal personnel that eliminated the necessity of clearing the entire area of personnel and interrupting operations in other bays when explosive limits allowed their presence. The system consists of electrical barriers which are placed around the bay, a blinker system operated by push button, an intercom and television control-gate interlocks. This equipment is controlled by those viewing the operation via closed circuit television, and it alerts all personnel in the area that a remote explosive machining operation is underway.

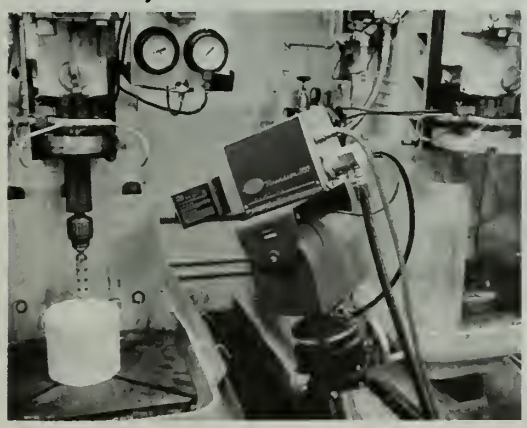


Photo 1

A television camera at Picatinny Arsenal is remotely aimed at a block of explosive that is undergoing a drilling operation. Equipped with Zoomar lens, the camera is mounted on a pan and tilt unit on a tripod.

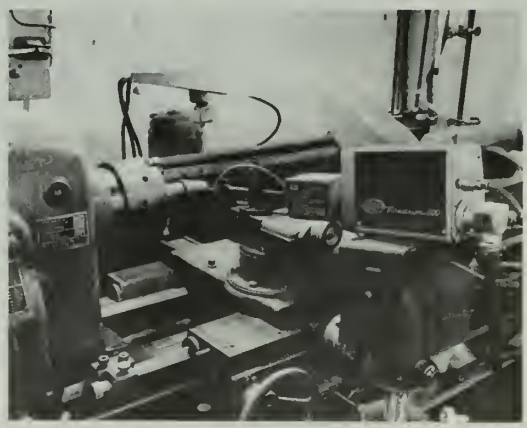


Photo 2

A television camera and its accessories are shown in operation in one of the Picatinny Arsenal machine bays where a piece of explosive is being turned on a lathe.

Photo 3

At Picatinny Arsenal remote controls for television cameras and the explosives milling machine are located in a bunker. Protected by barricades, the operator controls and watches the machining of new or modified explosive compositions.

ARE YOUR TESTS UP - TO - DATE ?

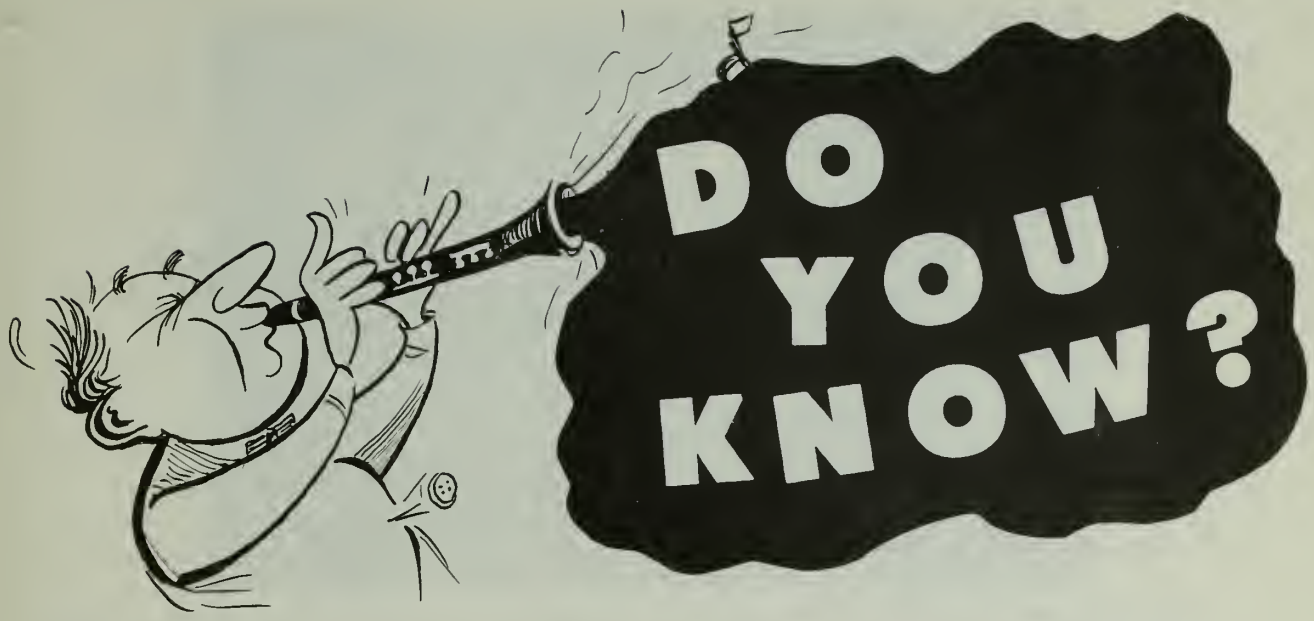
Safety Office
Savanna Army Depot

Paragraph 2504 of AMCR 385-224 states that operational shields for protection against items containing less than fifteen pounds of explosives may be of steel or other suitable material. The adequacy of these operational shields including thickness, size, and location should be proved by actual test. A minimum safety factor of twenty-five percent above the maximum expected charge, should be used in this test before the shield is permitted in regular operation.

A test was conducted recently at Savanna Army Depot on a previously tested pitch-in-grenade tank. The tank was constructed of one-half inch boiler plate and it contained three baffles designed to contain all fragments. Previous tests were conducted by utilizing the Mk II grenade plus a twenty-five percent overload. The tests indicated the tank was adequate. No fragments escaped from the tank, baffles remained intact and no holes were blown in the boiler plate.

The tank was retested prior to using it on an operation involving the M26 Composition B loaded grenade. In this test, the results were different. Two of the three baffles were blown completely out of the tank. One landed thirty feet from the tank and the other five feet away. One corner of the tank was ruptured by the blast. (See following photographs) If it had been assumed that the tank was adequate for M26 grenade operations, serious injuries might have occurred in event of an incident.

Based on the results of the second test, action should be taken to retest barricades or operational shields that are presently being used for protection against items containing different explosive fillers other than that for which they were originally tested.



Here are ten questions that will test your knowledge of explosives safety requirements that you will need under different circumstances. The answers to all of them may be found in AMCR 385-224. How many can you answer without referring to the regulation? The correct answers and references appear on page 34.

1. How is the adequacy of a steel operational shield for operations involving less than fifteen pounds of high explosives determined?

   Answer and Reference:

2. What is the maximum permissible saturated steam pressure for melting or keeping molten Composition B and similar binary explosives?

   Answer and Reference:

3. After visual inspection for and removal of explosives, what further precautionary measures should be taken before repairs are started in an explosives location?

   Answer and Reference:

4. What is the maximum temperature allowable in an oven used for drying freshly painted ammunition?

   Answer and Reference:

5. In field ammunition operations, what is the maximum rotational speed allowed for drilling exposed explosives?

   Answer and Reference:

6. For blending operations involving more than seventy pounds of tetryl, what is the minimum distance at which personnel should be located?

   Answer and Reference:

7. Should the physical dimensions of an operation shield for bulk high explosives differ from those of a shield for the same amount of high explosives contained in a shrapnel producing round?

   Answer and Reference:

8. What is the prerequisite for placing maintenance and tool rooms in an operating building when intraline separation cannot be provided?

   Answer and Reference:

9. A reinforced concrete wall thirty-six inches thick is considered an adequate operational shield for up to how many pounds of explosives?

   Answer and Reference:

10. Why is it essential that inadvertent mixing be avoided when more than one explosives material is handled on a line or within a building?

    Answer and Reference:

AWARDS OF HONOR CEREMONIES - FY 1965

Major General Frank A. Osmanski, Deputy Commanding General, U.S. Army Supply and Maintenance Command presents AMC Award of Honor to Colonel Herman P. Hoplin, Commander, Umatilla Army Depot for the best safety program in U.S. Army Supply and Maintenance Command in FY 1965. (Umatilla Army Depot also received the National Safety Council Award of Honor for ther FY 1965 program. Mr. James E. Johnson, Umatilla Army Depot Safety Director looks on.

M/Sgt. John C. Morgan, Safety NCO and Major Paul E. Needles, alternate Safety Officer, U.S. Army Aviation Materiel Laboratories, hold National Safety Council and AMC Awards of Honor for Safety for FY 1965 presented by Brigadier General Howard F. Schiltz, Commander, U.S. Army Aviation Materiel Command. Colonel John L. Klingenhagen, Commander of U.S. Army Aviation Materiel Laboratories.

AMC Awards of Merit Ceremonies
FY 1965

Col. M. S. Waters, Chief of Staff, U.S. Army Tank-Automotive Center presenting AMC Award of Merit for Safety to Mr. W. J. Foster, Safety Director, Lima Army Modification Center. Capt. N. Newman, CO, Lima Army Modification Center looks on.

Col. Fred. Kornet, Jr., CO, Watervliet Arsenal accepts AMC Award of Merit for Safety from Brig. Gen. Charles M. Prosser, Deputy Commander, U.S. Army Weapons Command. At the right is Mr. Frank J. McGinnis, Safety Director, Watervliet Arsenal

Mr. L. Braun, former Chief, Michigan Army Missile Plant Contracting Office receives AMC Award of Merit for Safety from Col. M.S. Waters, Chief of Staff, U.S. Army Tank-Automotive Center. Mr. F. Hunt, present Chief, Michigan Army Missile Plant Contracting Office looks on.

Brig. Gen. Thomas B. Simpson, Commander, U.S. Army Mobility Equipment Center, presents AMC Award of Merit for Safety to Col. Frank Milner, CO, Engineer Research and Development Labs. Looking on are Mr. Les R. Gregg, Safety Director, and Lt. Col. Jackson M. Bryant, Director of Facilities and Services, USA Mobility Equipment Center.

INJURY - FREE PERFORMANCE AWARDS

Colonel Edwin G. Moran, Headquarters, U.S. Army Supply and Maintenance Command presents National Safety Council Award of Merit to Colonel Roland Savilla, Commander, Atlanta Army Depot for 1,018,756 man-hours of injury-free performance.

Mr. Paul Hendrickson, Chief, Management Office, U.S. Army Aviation Materiel Command receives a Certificate from Brigadier General Howard F. Schiltz, Commander, U.S. Army Aviation Materiel Command for accident and injury-free operation during FY 1965. With fifty-seven employees, the Management Office was the largest element of AVCOM with a perfect FY 1965 safety record.

WELL... DID YOU KNOW?

Here are the answers to the questions on pages 29 and 30 All questions were based on information contained in AMCR 385-224. A reference to the pertinent paragraph follows each answer.

1. Adequacy of operational shields, including thickness, size, fastening, and location should be proved by actual test, with a minimum safety factor of 25 percent above the expected charge. Reference: Paragraph 2504a.

2. 15 psig (250°F.). Reference: Paragraph 2604a(1).

3. The entire area should preferably be wet or should be washed down thoroughly before the repairs are started. Reference: Paragraph 1621d.

4. 170°F. (76.7°C.). Reference: Paragraph 1212b.

5. 75 rpm. Reference Paragraph 2512a.

6. They should be located at a minimum of intraline distance from the operation. Reference: Paragraph 2602b.

7. No. Operational shields for bulk high explosives should be of the same physical dimensions as those for ammunition containing a comparable quantity of explosives. Reference: Paragraph 2504c.

8. When intraline separation cannot be provided, protection equivalent to that afforded by a substantial dividing wall must be provided.. Reference: Paragraph 1621i.

9. 70 pounds. Reference: Paragraph 2622a.

10. Inadvertent mixing of explosives materials must be avoided because it presents a hazard in equipment and in buildings and also can be hazardous if loaded in ammunition in such condition. Reference: Paragraph 2619b.

• REFERENCE PUBLICATIONS

AR 28-52, 25 February 1966
Welfare, Recreation and Morale - Army Sports Program

AR 95-2, Change 2, 9 February 1966
Aviation - Flight Regulations for Army Aircraft

AR 385-41, Change 1, 30 December 1965
Safety - U.S. Army Accident Codebook

AR 405-90, 23 December 1965
Real Estate - Disposal of Real Estate

AR 500-72, 14 January 1966
Emergency Employment of Army Resources - Survey, Utilization, Marking, and Stocking of Protective Shelter Areas on Military Installations

AR 700-52, 4 February 1966
Logistics - Licensing and Control of Sources of Ionizing Radiation

AR 700-65, Change 1, 11 January 1966
Logistics - Nuclear Weapons and Nuclear Weapons Materiel

AR 700-1300-8, Change 1, 25 February 1966
Logistics - Malfunctions Involving Ammunition and Explosives

AR 780-18, 18 January 1966
Depots - Organization and Command Relationships (See paragraph 16, page 4)

DA Cir. 55-25, 30 December 1965
Transportation and Travel - Improper Shipment of Dangerous Materials

DA Cir. 420-17, 20 January 1966
Repairs and Utilities - Fire Prevention and Protection, Military Gasoline Cans

SB 3-30, 8 December 1965
Serviceability Standard for CB Materiel

TM 55-650, December 1965
Highway Transportability Criteria for the United States

DA Pam. 28-6, December 1965
Intramural Sports for the Army

AMCR 385-2, 7 March 1966
Safety - Accident Reporting--Routing of Required Reports

Continued on Page 36

Requirement for Motor Carriers to Carry Two Full Fire Extinguishers Securely Mounted to Vehicle

Information has been furnished this Command of instances where motor vehicles transporting Class A and B Ammunition and Explosives are arriving at destinations with only one fire extinguisher instead of two.

The problem primarily concerns vehicles transporting Class B rocket motors from USASMC depots and vendors. It appears the problem exists because of misunderstanding of governing regulations, i.e. ICC regulations as against military regulations.

For clarification, DOD requirements exceed the ICC Motor Carrier Safely Regulations (Sec. 193.95(a)) which specifies a minimum of only one fire extinguisher. DOD requires two full fire extinguishers securely mounted to a vehicle.

The motor carriers written agreement with MTMTS specifies that two full fire extinguishers, must be carried.

National Safety Council Award Notifications

Sharpe Army Depot has been notified that a National Safety Council Award of Merit will be forwarded for operating 1,333,576 man-hours without a disabling injury from 21 December 1965 to 28 February 1966.

Tooele Army Depot has qualified for a National Safety Council Award of Merit for achieving 2,442,464 man-hours without a disabling injury from 1 October 1965 to 11 January 1966.

* * *

● Reference Publications (Continued)

AMCR 385-3, Change 3, 7 March 1966
Safety - Reports of Explosions, CBR Agent Releases, Serious Accidents and Nuclear Incidents at AMC Installations and Activities

TB 5-6600-227-15/1, 9 February 1966
Handling, Storage, and Disposal of Self-Luminous Compasses

• SAFETY NOTES

UNIVERSITY OF FLORIDA
3 1262 09304 9418

FLARE

UNITED STATES ARMY MATERIEL COMMAND

WASHINGTON, D.C. 20315